WHAT IS CLAIMED IS:

1. A Linear-in-dB variable gain amplifier using a switched capacitor system, comprising: a differential amplifier for receiving a differential signal from an external input terminal and outputting the differential signal amplified by a gain to an external output terminal; an input fixed capacitor for supplying the differential signal from the external input terminal to an input terminal of the differential amplifier in accordance with a first clock signal; a feedback loop fixed capacitor connected between the input terminal and an output terminal of the differential amplifier in accordance with a second clock signal having an inverted phase with respect to the first clock signal; a lower order control switch string composed of *m* switches for selectively changing a connection to the external input terminal side or the external output terminal side in accordance with a lower order gain control signal of m bits; a higher order control switch string composed of *n* switches that turn on/off the connection to the external input terminal side in accordance with a higher order gain control signal of *n* bits; a lower order capacitor string composed of *m* capacitors, each being connected in series to each switch of the lower order control switch string, and connected in parallel to the input fixed capacitor or the feedback loop fixed capacitor via one coupling capacitor by control of the lower order control switch string; and a higher order capacitor string composed of *n* capacitors, each being connected in series to each switch of the higher order control switch string, and connected in parallel to the input fixed capacitor by control of the higher order control switch string, wherein connections of the lower order capacitor string and the higher order capacitor string are controlled with the lower order gain control signal and the higher order gain control signal, and a capacitance ratio between the capacitors connected in parallel to the input fixed capacitor and the capacitors connected in parallel to the feedback loop fixed capacitor is changed, whereby a decibel value of a gain is changed linearly with respect to a linear change of a gain control signal of (m+n) bits composed of the lower order gain control signal and the higher order gain control signal,

the variable gain amplifier comprising:

a first control switch string for correction composed of *n* switches that turn on/off the connection to the external output terminal side in accordance with the higher order gain control signal;

a second control switch string for correction composed of *m* switches

that turn on/off the connection to the external output terminal side in accordance with the lower order gain control signal, which is opposite in operation to the first control switch string for correction;

a first correction capacitor string composed of *n* correction capacitors each being connected in series to each switch of the first control switch string for correction, and connected in parallel to the feedback loop fixed capacitor by control of the first control switch for correction; and

a second correction capacitor string composed of *m* correction capacitors each being connected in series to each switch of the second control switch string for correction, and connected in parallel to the feedback loop fixed capacitor by control of the second control switch string for correction.

2. The Linear-in-dB variable gain amplifier according to claim 1, wherein when defining that a unit capacitance of the capacitor string is C, capacitance Cs of the input fixed capacitor is equal to $A \cdot C$, capacitance Cf of the feedback loop fixed capacitor is equal to $B \cdot C$, the coefficients A and B are determined by a maximum value Gmax and a minimum value Gmin of a gain controlled with the gain control signal of (m+n) bits, and when defining that an intermediate value between the maximum value Gmax and the minimum value Gmin of the gain is Gmid, the higher order gain control signal is *x* in a decimal number notation, the lower order gain control signal is *y* in a decimal number notation, the gain control signal is $Code = 2^m \cdot x + y$ in a decimal number notation, and coefficients for approximating gain control characteristics to Linear-in-dB approximately by using the coefficients A, B, the maximum value Gmax, the minimum value Gmin and the intermediate value Gmid of the gain are p and q,

the first and second capacitor strings for correction correct a characteristics curve of a gain G with respect to the Code so as to be represented by

$$G = (2^m \cdot Cs/p + Code \cdot C)/(2^m \cdot Cf/p + (2^{m+n} - 1 - q \cdot Code) \cdot C/p)$$

that passes through the maximum value Gmax, the minimum value Gmin, and the intermediate value Gmid.

3. The Linear-in-dB variable gain amplifier according to claim 2, wherein the capacitors constituting the lower order capacitor string have a capacitance

ratio of C, 2C, 4C, ..., 2^{m-1}C, the capacitors constituting the higher order capacitor string have a capacitance ratio of C, 2C, 4C, ..., 2^{n-1}C, and when defining a = (p – q)/p, the correction capacitors constituting the first correction capacitor string have a capacitance ratio of (1–a)C, 2(1–a)C, 4(1–a)C, ..., 2^{n-1}(1–a)C, and the correction capacitors constituting the second correction capacitor string have a capacitance ratio of aC/2^m, 2aC/2^m, 4aC/2^m, ..., 2^{m-1}aC/2^m.